DOCUMENT RESUME

ED 139 140 EC 100 715

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TITLE Intercorrelation of the WISC-R and the Renzulli-Hartman Scale for Determination of Gifted Placement.
PUB DATE Apr 77
NOTE 23p.; Paper presented at the Annual International Convention, The Council for Exceptional Children (55th, Atlanta, Georgia, April 11-15, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Comparative Testing; Elementary Education; *Gifted; Intelligence Tests; *Student Evaluation; *Student Placement
IDENTIFIERS *Renzulli Hartman Scale; Wechsler Intelligence Scale for Children Revised

ABSTRACT

In order to compare the Wechsler Intelligence Scale for Children--Revised (WISC-R) and the Renzulli-Hartman Scale for Determination of Gifted Placement, 192 potentially gifted elementary students were rated on both tests. A correlation matrix indicated that one of the four subscales of the Renzulli-Hartman Scale, the Learning Characteristics Scale, was significantly positively correlated with each of the WISC-R IQs, while the other three were not. A discriminant analysis indicated that the first three scales of the Renzulli-Hartman were able to differentiate between gifted and nongifted groups, although they had low positive correlations with gifted placement. Results suggest that the Renzulli-Hartman Scale could be best used in planning educational goals for students after placement. (CL)

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Intercorrelation of the WISC-R and the Renzulli-Hartman Scale for Determination of Gifted Placement

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EC 100715

INTERCORRELATION OF THE WISC-R AND THE RENZULLI-HARTMAN SCALE FOR DETERMINATION OF GIFTED PLACEMENT

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Increasing attention has been given to those methods of identifying exceptional children which utilize broader vantage points than provided by the traditional IQ test, the achievement test, and grades. In addition to formal testing procedures, investigators have emphasized the role of teachers (Renzulli, Hartman, & Callahan, 1971), parents (Martinson, 1974), and peers (Granzin & Granzin, 1969) in calling attention to the multifaceted nature of various kinds of exceptionalities. The Scale for Rating Behavioral Characteristics of Superior Students (Renzulli-Hartman Scale) has been offered as an additional means for teachers to objectively rate students' abilities. Renzulli et al. (1971) state that as an aid in identifying superior children, this scale "represents a more objective and systematic instrument . . . in guiding teacher judgment in the identification process" (p. 211). He cautions that it is not intended to replace existing procedures, such as IQ tests, achievement tests, and creativity tests, but should be used concurrently with other criteria.

The Renzulli-Hartman Scale consists of four subscales: (a) Learning Characteristics, consisting of eight items,

(b) Motivation Characteristics, with nine items, (c) Creativity Characteristics, ten items, and (d) Leadership Characteristics, ten items. Items were gleaned from research. An item was included in the Scale only if three separate studies called attention to the behavioral characteristic it represented. Items were categorized rationally and presented on the rating form under the proper heading.

The Renzulli-Hartman Scale requires that several teachers be asked to rate the child on a continuum from one (seldom or never observed) to four (almost always observed) for each of the thirty-seven items. Renzulli suggests that the four scales not be summed so as to produce a total score since "The four dimensions of the instrument represent relatively different sets of behavioral characteristics" (p. 214). After computing the mean score for each scale, the author suggests that those children "who deviate markedly upward from the mean should be considered likely candidates for placement" (p. 214) in activities designed to enhance the particular abilities indicated by that scale. Renzulli noted that predetermined cutoff points could not be provided due to variations in student populations and programs. He suggests that users of the Renzulli-Hartman Scale emphasize the "high point scale" in determining types of educational experiences needed. Thus, a child with a high score on the Motivational Characteristics Scale could "profit from a program that emphasizes self-initiated pursuits" (p. 214).

The reliability of the Renzulli-Hartman Scale has been evaluated using the test-retest procedure with a three month delay on an upper elementary population. The reliabilities of the scales ranged from .77 to .91, and interjudgment reliability ranged from .67 to .89. Each of the scales was found to differentiate between a gifted and nongifted group of fifth grade students ($p < .01$). The Learning Characteristic Scale correlated .61 ($p < .01$) with a standardized intelligence test and the Motivation Characteristic correlated .50 ($p < .01$) with a standardized achievement test. The Creativity Characteristic Scale compared favorably ($p < .05$ and $p < .01$) with the three verbal subscores on the Torrance Test of Creative Thinking. The Leadership Characteristic Scale correlated well ($p < .01$) with peer ratings when fourth and fifth graders were used. Less than favorable conditions were found when sixth graders were used, possibly due to an age/grade effect.

The present investigation was conducted to further evaluate the Renzulli-Hartman Scale and to compare it with the WISC-R as an aid in identifying and planning educational programs for gifted children. The questions of interest for this investigation are listed below.

1. Do the Renzulli-Hartman Scales correlate with the most frequently used individual intelligence test--the WISC-R?
2. Which of the WISC-R subtests are most related to the Renzulli-Hartman Scales?

3. Which WISC-R subtests are significantly related to gifted group membership?
4. Are the Renzulli-Hartman Scales reliable in differentiating between gifted and normal groups of children?
5. Do the Renzulli-Hartman subscales represent relatively independent sets of behavioral characteristics?
6. Is the Renzulli-Hartman Scale useful at each elementary grade, and, can the scale scores be averaged across grade levels?
7. Do high IQ and low IQ children produce different patterns of scores on the WISC-R factors?

Method

Instruments

The Renzulli-Hartman Scale and the WISC-R were used in this study.

Subjects

The present investigation involved 192 elementary school children drawn from a Southern public school population of six thousand. The children were enrolled in grades one through five.

Procedure

During the 1975-1976 school year, each teacher was asked to rate potential "gifted" students on the Renzulli-Hartman Scale and submit these ratings to the school psychology department. This method produced 276 referrals. A team of graduate students in psychology administered the WISC-R to those children referred by the teachers. A copy of the Renzulli-Hartman Scale and of

the psychological report were submitted to a university screening committee which was responsible for placement decisions.

Following placement decisions for all 276 students, information was collected pertaining to each child's (a) Renzulli-Hartman Scale scores, (b) Number of months known by the rating teacher, (c) WISC-R scaled scores and IQs, (d) Race, (e) Sex, (f) Age at time of testing, (g) Grade, and (h) Participation in the free lunch program (indication of socioeconomic level). Information was completed on 192 of the original 276 children. This represented 70% of the referrals. For the remaining 84 children, either some relevant information was missing or a test other than the WISC-R was used. Table 1 presents descriptors regarding the total population.

Table 1

Description of the Population

Sex	n	Race		Mean Age	Mean Grade	Mean No. of Months Child Was Known by Rater of Renzulli-Hartman
		White	Non-White			
Boys	76	55	21	8 yrs, 10 mos	2.96	10.09
Girls	116	71	45	8 yrs, 10 mos	2.98	8.53

Table 2 presents information regarding the gifted and non-gifted groups.

Table 2

"Gifted" and "Nongifted" Group Parameters

Category	n	Sex		Race		Mean Age	Mean Grade	Mean No. of Months Child Was Known by Rater of Renzulli-Hartman
		M	F	White	Non-White			
Gifted	58	36	22	53	5	8 yrs, 10 mos	3.09	7.9
Non-gifted	134	79	55	73	61	8 yrs, 10 mos	2.93	9.7

The mean age for each group was eight years, ten months. There was no significant sex difference between the groups. The Renzulli-Hartman ratings were completed when the teachers had known the children in the gifted group an average of 7.9 months and children in the nongifted group for an average of 9.7 months. This did not represent a significant difference in the length of time the teachers had known children in the two groups.

Statistical Analysis

A correlation matrix was formed to determine the strength of relationship between the Renzulli-Hartman, the WISC-R IQs and scaled scores, and gifted placement. The ability of the Renzulli-Hartman and the WISC-R to differentiate between the gifted and nongifted groups was tested with discriminant analysis. A principal factor analysis was used to determine the independence of the four Renzulli-Hartman scales. A five by three analysis of variance was used to determine the plausibility of

averaging Renzulli-Hartman scale scores across grade levels. A two by three repeated measures analysis of variance was conducted to determine if high IQ children do produce different patterns of scores on the WISC-R factors than do children with lower IQs.

Results and Discussion

The results will be discussed in the order in which the questions were presented.

Table 3 presents a correlational matrix for the WISC-R and Renzulli Scales. The Learning Characteristic Scale has a significant ($p < .01$) positive correlation with each of the WISC-R IQs. The correlations, however, were not as high as those reported by Renzulli et al. (1971). The Creativity Scale and the Leadership Scale did not correlate significantly with any WISC-R subtest or IQ. This finding concurs with the validation study. Unlike previously reported, the Motivation Scale did not correlate significantly with IQ. With the exception of the Leadership Characteristic Scale, the Renzulli-Hartman subscales have a significant, though low, positive correlation with gifted placement. The Learning Characteristic Scale is only a slightly better indication of placement than the other Renzulli-Hartman scales.

Thus Table 3 also indicates that the Renzulli-Hartman Learning Characteristic Scale is significantly related to the WISC-R Comprehension, Vocabulary, Information, Block Designs, and Arithmetic subtests. The WISC-R Vocabulary, Comprehension and

Information subtests are also the three subtests which are most related to gifted group membership. Kaufman (1975) considers each of these subtests, with the exception of the Arithmetic subtest, to be good measures of general intellectual abilities. The Arithmetic subtest was considered to be a fair measure of general intellectual abilities. The Renzulli-Hartman Learning Scale appears to be a low power indicator of general intelligence. Tests of general intelligence appear to be most related to gifted placement.

Table 4 presents the results of a discriminant analysis between the gifted (n = 58) and nongifted (n = 134) groups for each of the 17 variables. The table has been arranged in descending order of the F ratio. The first three scales of the Renzulli-Hartman were able to differentiate between the two groups ($p < .01$). However, the low correlation between these scales and gifted placement suggests that their ability to discriminate reliably is questionable. Judging from the size of the F ratio, as well as the correlation coefficients on Table 3, the best predictors of placement would be, first, the WISC-R FSIQ, then the Verbal IQ, and, third, the Comprehension, Vocabulary, Information subtests. This hypothesis was tested using several separate multiple regression analyses of the WISC-R and its subtests in predicting gifted placement. The WISC-R FSIQ was the best predictor and accounted for 55% of the total variance (r = .74) and Verbal IQ was second (r = .72). The WISC-R Comprehension, Vocabulary, Coding and Block Designs subtests

Table 3

Correlation Matrix for WISC-R and Renzulli-Hartman Scales (N = 192)

		WISC-R												Renzulli				
		INF	SIM	ARI	VOC	COM	PC	PA	BD	OA	COD	VIQ	PIQ	FSIQ	LrnC	MC	CC	LdrC	GIFTED
WISC-R	INF																		
	SIM	.65																	
	ARI	.48	.48																
	VOC	.76	.67	.52															
	COM	.68	.58	.48	.78														
	PC	.49	.43	.33	.50	.46													
	PA	.49	.41	.37	.54	.53	.34												
	BD	.54	.46	.39	.62	.55	.62	.47											
	OA	.52	.39	.41	.56	.50	.57	.44	.75										
	COD	.20		.20	.24														
	VIQ	.86	.81	.69	.90	.85	.52	.56	.61	.56									
	PIQ	.64	.52	.48	.71	.63	.75	.67	.85	.83	.41	.71							
	FSIQ	.82	.73	.64	.88	.81	.68	.66	.78	.74	.33	.93	.91						
Renzulli	LrnC	.23		.22	.24	.26			.23			.25	.23	.27					
	MC														.77				
	CC														.66	.74			
	LdrC														.62	.65	.47		
	GFTD	.60	.51	.48	.67	.67	.41	.50	.52	.46	.30	.72	.63	.74	.30	.22	.20		

Critical Values of r

$p < .05$ ($df = 150$) = .159

$p < .01$ ($df = 150$) = .208

Table 4

Discriminant Analysis for Twenty-Three Variables On Gifted (n = 58) and Nongifted (n = 134) Placed Children

Variable	F	P
WISC-R		
FSIQ	168.29	.0000
VIQ	149.35	.0000
COM	149.22	.0000
VOC	149.16	.0000
INF	101.62	.0000
PIQ	99.92	.0000
BD	67.45	.0000
S	65.74	.0000
PA	61.04	.0000
A	54.20	.0000
OA	51.35	.0000
PC	38.96	.0000
Renzulli Learning Scale	19.23	.0001
WISC-R Coding	19.13	.0001
Renzulli Motivation Scale	9.75	.0025
Renzulli Creativity Scale	7.83	.0058
Renzulli Leadership Scale	2.01	.1544

were the best group of subtest predictors. These four subtests accounted for 51% of the total variance (R = .71). Factor analysis has indicated that the Coding subtest has proportionately more unique variance than common variance, therefore partially explaining its inclusion among the subtests which form the best group of predictors.

Sattler (1974) notes that the validity coefficient for the WISC-R short form using the Vocabulary, Comprehension, and Block Design subtests is .924. Therefore these four WISC-R subtests

are sufficient measures of the Full Scale IQ and the best combination of subtests as predictors for gifted placement.

The correlation matrix shows a significant inter-scale relationship ($p < .01$) among the Renzulli-Hartman Scales. This indicates that the scales are not unrelated. The principal component factor analysis for the four Renzulli-Hartman scales found that 74% of the variance could be accounted for with one factor. When two factors were rotated, the Leadership Scale had a moderate loading on a second factor. The two factor solution accounted for 87.6% of the total variance. A second factor analysis was computed using squared multiple correlations as estimates of the commonalities. This analysis also indicated that a one factor solution provided the best description of the Renzulli-Hartman Scale. This suggests that the scales are not relatively independent. Summing the scale scores may or may not be an advantage.

Table 5 presents the means and standard deviations of the scales by grade level and type of placement. Across the grade levels, the means of the scales show significant variation. A significant difference was found between grade levels, $F\ (4,552) = 3.304$, $p < .05$. Figure 1 presents the average scale scores graphically. On the Motivation, Creativity, and Leadership Scales, first graders averaged ratings which exceeded the average ratings for the gifted group. Also, ratings for fourth graders on the Leadership Scale were higher than the gifted group. Mean scale scores for the second graders were the lowest of all grade levels. In general, an age/grade trend may be

Table 5

Renzulli-Hartman Scale Means and Standard Deviations by Grade and Type Placement

		Learn. Char.		Motiva. Char.		Creat. Char.		Leadership Char.	
	n	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
1st Grade	39	24.7	5.1	26.5	5.5	27.1	5.6	33.0	5.7
2nd Grade	43	21.0	6.9	22.8	5.6	22.7	6.3	29.8	6.5
3rd Grade	33	22.8	5.6	24.1	6.4	25.1	6.1	31.5	7.2
4th Grade	40	23.4	4.8	24.5	4.6	25.5	5.8	33.2	4.7
5th Grade	34	22.2	5.7	23.5	6.8	23.8	7.1	29.7	6.0
Gifted	58	25.5	5.3	26.2	5.6	26.7	6.0	32.3	6.2
Nongifted	134	21.5	5.6	23.3	5.8	23.9	6.3	30.9	6.2
Composite	192	22.8	5.8	24.3	5.9	24.8	6.4	31.5	6.2

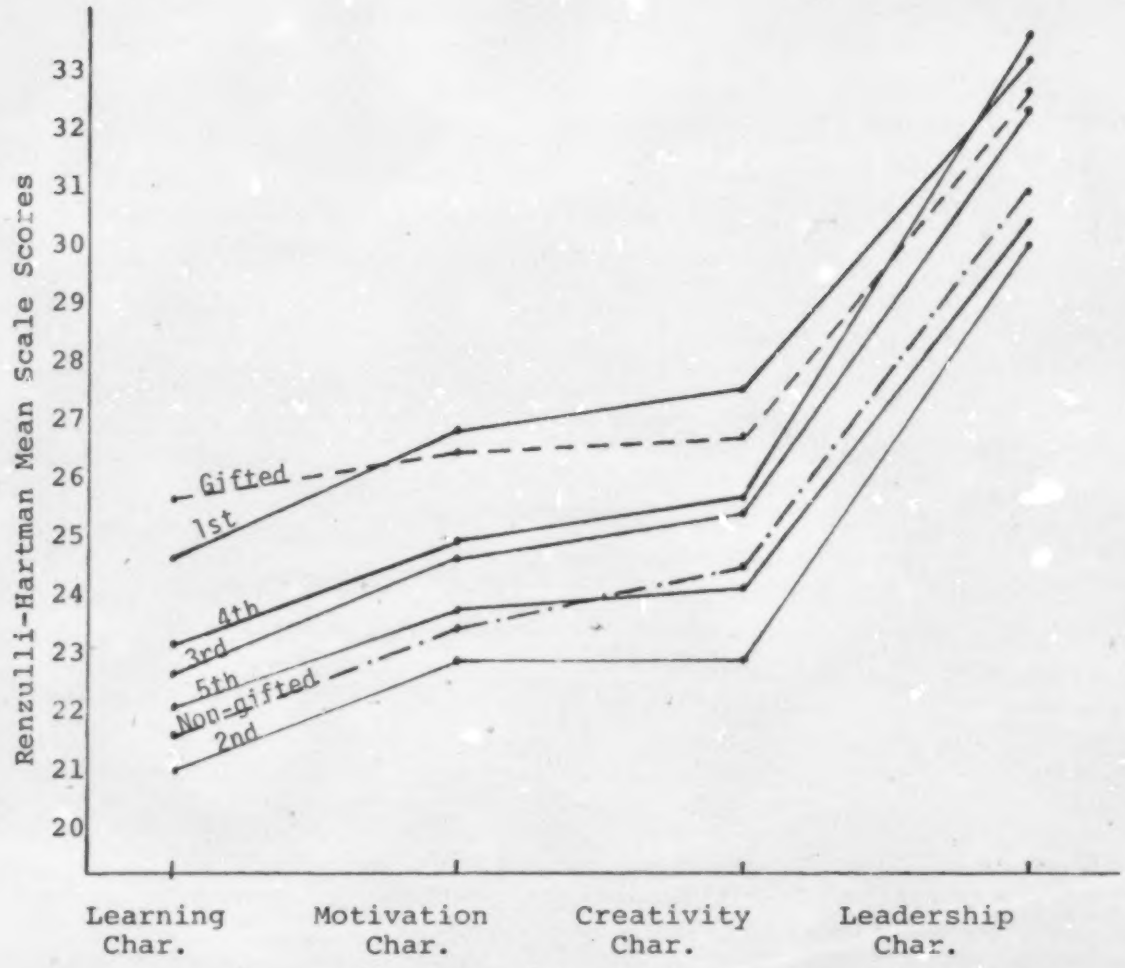


Figure 1. Graphic representation of Renzulli-Hartman mean scale scores by grade level and gifted placement.

observed in the ratings on the scales. Averaging across grade levels appears unwise.

Table 6 presents the results of an analysis of variance of the three WISC-R factors (Kaufman, 1975) for 27 gifted ($IQ \geq 127$) and the 27 nongifted ($IQ \leq 91$) children.

Table 6

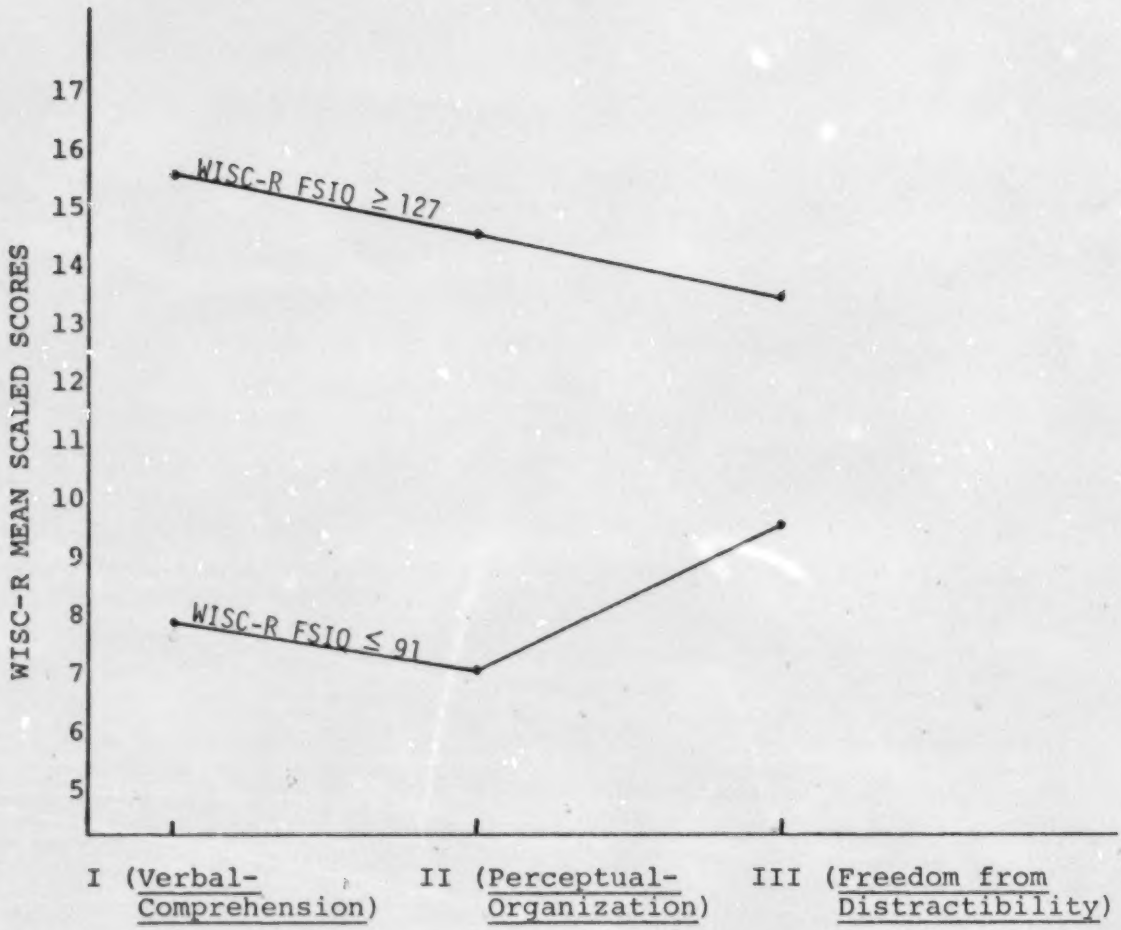
Analysis of Variance of WISC-R Factors* for the Twenty-Seven Children with Highest FSIQs (≥ 127) and the Twenty-Seven Children with Lowest FSIQs (≤ 91)

Source	MS	df	F	p
Total	13.20	161		
Between	33.48	53		
Groups	1665.92	1	798.62	.0000
Error (G)	2.09	52		
Within	3.24	108		
Trials	17.59	2	8.38	.0007
G by T	48.42	2	23.07	.0000
Error (T)	2.10	104		

*Kaufman (1975)

Factors	WISC-R Subtests
Verbal - Comprehension	VOC, INF, COMP, S
Perceptual - Organization	BD, OA, PC, PA
Freedom from Distractibility	A, DS, COD

A significant difference was found between the two groups on all factors. There was also an interaction between group membership and scores on the three factors. Figure 2 presents these results graphically. A Newman Keuls test was conducted on the treatments for each group.



High IQ Group: Verbal Comprehension factor was significantly higher than the Perceptual-Organization or Freedom from Distractibility factors ($p < .01$). There was no difference between factors II and III.

Low IQ Group: Freedom from Distractibility factor was significantly higher than the Verbal-Comprehension or Perceptual-Organization factors ($p < .01$). The Verbal-Comprehension factor was significantly higher than the Perceptual-Organization factor ($p < .05$).

Figure 2. Graphic representations for ANOVA of WISC-R factors for high and low IQ groups.

For the high IQ group, the Verbal-Comprehension factor was significantly higher than the Perceptual-Organization and/or Freedom from Distractibility factors ($p < .01$). The high IQ group had significantly better verbal skills. For the low IQ group, the Freedom from Distractibility factor was significantly higher than either the Verbal-Comprehension or Perceptual-Organization factors ($p < .01$). However, similar to the high IQ group, the Verbal Comprehension factor was significantly higher than the Perceptual-Organization factor ($p < .05$).

Keogh, Wetter, and McGinty (1973) found that the learning disabled children have depressed scores on the Freedom from Distractibility factor, thus indicating a difficulty with attention and/or concentration skills. In contrast, the present findings suggest that when children of normal intelligence are referred by teachers as candidates for gifted placement, they typically display heightened skills in attention and concentration when compared to their verbal and performance skills.

Summary

The Renzulli-Hartman Scale contains three subscales (excluding the Leadership Scale) which can differentiate between gifted and normal children. However, these scales have low positive correlations with gifted placement. The scales could best be utilized diagnostically in planning educational goals for each child after placement. They do not provide the best data for gifted placement decisions and therefore should not be used as the initial criterion. There is sufficient evidence that the

scales are not orthogonal. There is a high degree of intercorrelation, and a principal-factor analysis indicated that one factor can adequately describe the Renzulli-Hartman scales. Although there is no evidence that summing across the scales would make the scales invalid, this study did not determine that such practice would be beneficial. Removing the scale names and intermixing the items may increase validity by taking precautions against a "halo effect."

Ratings on the Renzulli-Hartman are best averaged over each grade level rather than across grades, as an age/grade trend is probable. Renzulli et al. (1971) mentioned an age/grade trend for the Leadership Scale. Predictive ability may be more reliable by taking into consideration this age/grade effect.

The WISC-R Vocabulary, Comprehension, Coding, and Block Designs subtests were the best subtest predictors of gifted placement. Three of the four subtests are considered to be good measures of general intelligence (Kaufman, 1975), and this combination of subtests has a minimum coefficient of validity of .924 with the full scale IQ (Sattler, 1974). These subtests should be given in cases where it is not possible to use the entire scale.

There was a tendency for children who were referred as candidates for gifted placement, but not so placed, to score higher on the WISC-R Freedom from Distractibility factor than the Verbal-Comprehension or Perceptual-Organization factors. This suggests that such children may be more attentive than their peers. Children with higher IQs tended to have all three WISC-R factors

elevated with the Verbal-Comprehension factor being highest. In cases where doubts as to placement exist, all eleven WISC-R subtests may offer a functional analysis of the child's abilities.

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